

WHAT IS CLAIMED IS:

1. A semiconductor device comprising a first electrode, a ferroelectric film formed above the first electrode, and a second electrode formed above the ferroelectric film, further comprising

an intermediate layer of perovskite crystal structure formed at least one of boundary between the first electrode and the ferroelectric film, and boundary between the ferroelectric film and the second electrode.

2. A semiconductor device according to claim 1, wherein

the intermediate layer is  $\text{BaTiO}_3$  layer,  $\text{SrTiO}_3$  layer, or  $\text{CaTiO}_3$  layer.

3. A semiconductor device according to claim 2, wherein

the intermediate layer further contains at least any element of Ca, Sr, Tl, Pb, Bi, rare earth element, Nb, Ta, W, Mo, Fe, Co, Cr, and Zr.

4. A semiconductor device according to claim 1, wherein

the first electrode and/or the second electrode is base metal.

5. A semiconductor device according to claim 2, wherein

the first electrode and/or the second electrode is base metal.

6. A semiconductor device according to claim 3, wherein

the first electrode and/or the second electrode is base metal.

7. A semiconductor device according to claim 4, wherein

the base metal is Ni, Cu or Cr.

8. A semiconductor device according to claim 5, wherein

the base metal is Ni, Cu or Cr.

9. A semiconductor device according to claim 6, wherein

the base metal is Ni, Cu or Cr.

10. A semiconductor device according to claim 1, wherein

the ferroelectric film is lead-based oxide ferroelectric film.

11. A semiconductor device according to claim 10, wherein

the lead-based oxide ferroelectric film is  $\text{PbZr}_x\text{Ti}_{1-x}\text{O}_3$  film.

12. A semiconductor device according to claim 11, wherein

the  $\text{PbZr}_x\text{Ti}_{1-x}\text{O}_3$  film further contains at least any element of La, Sr and Ca.

13. A semiconductor device according to claim 1,

wherein

the ferroelectric film is  $(AO)_2(B_{Y-1}C_YO_{3Y+1})$  film wherein A is at least any element of Tl, Pb, Bi and rare earth element; B is at least any element of Bi, Pb, Ca, Sr and Ba; C is at least any element of Ti, Nb, Ta, W, Mo, Fe, Co, Cr and Zr; and Y is any of 2, 3, 4 and 5.

14. A semiconductor device according to claim 13, wherein

the ferroelectric film is bismuth layer structure ferroelectric film.

15. A semiconductor device according to claim 14, wherein

the bismuth layer structure ferroelectric film is  $SrBi_2Ta_2O_9$  film,  $Bi_2Ba_2Ti_3O_{12}$  film or  $Bi_2Ca_3Ti_4O_{15}$  film.

16. A semiconductor device comprising a capacitor including a first electrode, a ferroelectric film formed above the first electrode, and a second electrode formed above the ferroelectric film; and a transistor connected to the first electrode or the second electrode, further comprising

an intermediate layer of perovskite crystal structure formed at least one of boundary between the first electrode and the ferroelectric film, and boundary between the ferroelectric film and the second electrode.

17. A method for fabricating a semiconductor device comprising the step of forming a first electrode, the step

of forming a ferroelectric film above the first electrode, and the step of forming a second electrode above the ferroelectric film, further comprising

the step of forming an intermediate layer which is carySTALLIZABLE into perovskite structure after the step of forming the first electrode and before the step of forming the ferroelectric film and/or after the step of forming the ferroelectric film and before the step of forming the second electrode.

18. A method for fabricating a semiconductor device according to claim 17, wherein

in the step of forming the intermediate layer, the intermediate layer is formed in an inert atmosphere.

19. A method for fabricating a semiconductor device according to claim 17, wherein

the intermediate layer and the ferroelectric film are formed without exposed to ambient atmosphere.